WE CLAIM:

1. A method of producing a plate of single crystal diamond, which includes the steps of providing a diamond substrate having a surface substantially free of surface defects, growing diamond homoepitaxially on the surface by chemical vapour deposition (CVD) and severing the homoepitaxial CVD grown diamond and the substrate transverse to the surface of the substrate on which diamond growth took place to produce a plate of single crystal CVD diamond.

2. A method according to claim 1, wherein the homoepitaxial CVD grown diamond and the substrate are severed normal to the surface of the substrate.

3. A method according to claim 1, wherein the growth thickness of the homoepitaxial CVD grown diamond is greater than about 10 mm.

4. A method according to claim 3, wherein the growth thickness of the homoepitaxial CVD grown diamond is greater than about 12 mm.

5. A method according to claim 4, wherein the growth thickness of the homoepitaxial CVD grown diamond is greater than about 15 mm.

6. A method according to claim 1, wherein the single crystal CVD diamond plate has at least one linear dimension exceeding 10 mm.

7. A method according to claim 1, wherein the diamond substrate is a plate of single crystal CVD diamond produced by the method according to claim 1.

8. A method according to claim 1, wherein the original substrate remaining in the single crystal CVD diamond plate is removed.

9. A method according to claim 1, wherein the single crystal CVD diamond plate has a rectangular, square, parallelogram or like shape.

10. A (001) single crystal CVD diamond plate having major surfaces on opposite sides thereof bounded by {100} side surfaces, each major surface having at least one linear dimension exceeding 10 mm.

11. A diamond plate according to claim 10, wherein at least one linear dimension exceeds 12 mm.

12. A diamond plate according to claim 11, wherein at least one linear dimension exceeds 15 mm.

13. A diamond plate according to claim 10, having first and second linear dimensions exceeding 10 mm.

14. A diamond plate according to claim 13, wherein the first and/or the second linear dimension exceeds 12 mm.

15. A diamond plate according to claim 14, wherein the first and/or the second linear dimension exceeds 15 mm.

16. A diamond plate according to claim 10, which is a rectangular (001) single crystal diamond plate bounded by {100} side surfaces, wherein the at least one linear dimension is an axis, lateral dimension or lateral edge dimension.

17. A diamond plate according to claim 10, wherein the at least one linear dimension is a <100> edge formed by the intersection of a {100} side surface with a major surface.

18. A diamond plate according to claim 13, wherein the first and second linear dimensions are orthogonal <100> edges formed by the int rsection of respective {100} side surfaces with a major surface.

19. A diamond plate according to claim 10, which has a rectangular, square, parallelogram or like shape.

20. A single crystal CVD diamond plate having major surfaces on opposite sides thereof, and having dislocations intersecting the major surfaces, wherein the density of the dislocations intersecting the major surfaces does not exceed 50/mm^2.

21. A diamond plate according to claim 20, wherein the density of the dislocations intersecting the major surfaces does not exceed 20/mm^2.

22. A diamond plate according to claim 21, wherein the density of the dislocations intersecting the major surfaces does not exceed 10/mm^2.

23. A diamond plate according to claim 22, wherein the density of the dislocations intersecting the major surfaces does not exceed 5/mm^2.

24. A diamond plate according to claim 20, wherein the density of dislocations intersecting any other plane in the diamond plate does not exceed the respective density limit of the dislocations intersecting the major surfaces.

25. A diamond plate according to claim 20, wherein at least one linear dimension exceeds 10 mm.

26. A single crystal CVD diamond plate, having major surfaces on opposite sides thereof, and having dislocations produced during growth, wherein the dislocations are oriented in a direction generally parallel to at least one of the major surfaces.

27. A diamond plate according to claim 26, wherein the direction of the dislocations is at an angle of less than 30° relative to at least one of the major surfaces.

28. A diamond plate according to claim 27, wherein the direction of the dislocations is at an angle of less than 20° relative to at least one of the major surfaces.

29. A diamond plate according to claim 28, wherein the direction of the dislocations is at an angle of less than 10° relative to at least one of the major surfaces.

30. A diamond plate according to claim 29, wherein the direction of the dislocations is at an angle of less than 5° relative to at least one of the major surfaces.

31. A diamond plate according to claim 26, wherein each major surface has a first linear dimension, corresponding in direction to the general direction of the dislocations, exceeding 2 mm.

32. A diamond plate according to claim 31, wherein the first linear dimension exceeds 3 mm.

33. A diamond plate according to claim 32, wherein the first linear dimension exceeds 4 mm.

34. A diamond plate according to claim 33, wherein the first linear dimension exceeds 5 mm.

35. A diamond plate according to claim 34, wherein the first linear dimension exceeds 7 mm.

36. A diamond plate according to claim 31, wherein a second linear dimension of each major face orthogonal to the first linear dimension is equal to or greater than the first linear dimension.

37. A single crystal CVD diamond plate, having major surfaces on opposite sides thereof, and having dislocations produced during growth, wherein the mean dislocation direction is oriented in a direction offset from the normal to at least one of the major surfaces.

38. A diamond plate according to claim 37, wherein the mean dislocation direction is offset from the normal to at least one of the major surfaces by an angle exceeding 20°.

39. A diamond plate according to claim 38, wherein the mean dislocation direction is offset from the normal to at least one of the major surfaces by an angle exceeding 30°.

40. A diamond plate according to claim 39, wherein the mean dislocation direction is offset from the normal to at least one of the major surfaces by an angle exceeding 40°.

41. A diamond plate according to claim 40, wherein the mean dislocation direction is offset from the normal to at least one of the major surfaces by an angle exceeding 50°.